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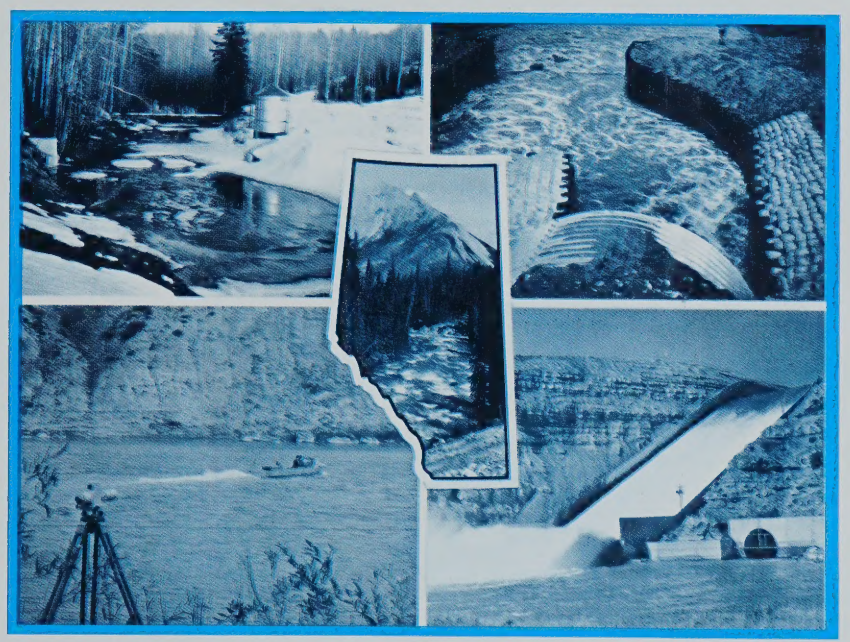
Alberta

Dept of the ENVIRONMENT



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WATER RESOURCES DEVELOPMENT PROGRAM

PROJECTED LEVELS OF

CAPITAL EXPENDITURE

1974-75 to 1985-86
Supersedes July Report

Environmental Engineering Support Services

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AUGUST, 1974

WATER RESOURCES DEVELOPMENT PROGRAM

PROJECTED LEVELS OF

CAPITAL EXPENDITURE

1974-75 to 1985-86
Supersedes July Report

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WATER RESOURCES DEVELOPMENT PROGRAM

PROJECTED LEVELS OF CAPITAL EXPENDITURE

1974-75 to 1985-86

Prepared For

HON. W.J. YURKO, P. ENG., MINISTER OF THE ENVIRONMENT

Compiled By

ENVIRONMENTAL ENGINEERING SUPPORT SERVICES

W. SOLODZUK, P. ENG.

ASSISTANT DEPUTY MINISTER

AUGUST, 1974

ENVIRONMENT

403/425-1130

7th Floor, Milner Building
Edmonton, Alberta, Canada T5J 0Z6

Office of
the Deputy Minister

July 10, 1974

Hon. W.J. Yurko, P. Eng.
Minister
Alberta Environment

Dear Sir:

Water is recognized as a key and basic component for municipal and industrial growth. Therefore government's planning will require adequate attention to the availability of this essential resource and also attention has been directed to resolving certain water resources problems.

I am pleased to present this report entitled "Water Resources Development Program Projected Levels of Capital Expenditure". The purpose of this submission is to indicate the magnitude of capital expenditures that are necessary to resolve the wide range of presently identified matters affecting water resources management and development. The projection includes anticipated expenditures up to and including the year 1985 in 1974 dollar values. There has been no attempt made to predict inflationary escalation of costs for the projected time frame.

Estimates of cost for the implementation of major projects in the period 1980-85 must be considered as preliminary since investigations and studies for these projects are just underway.

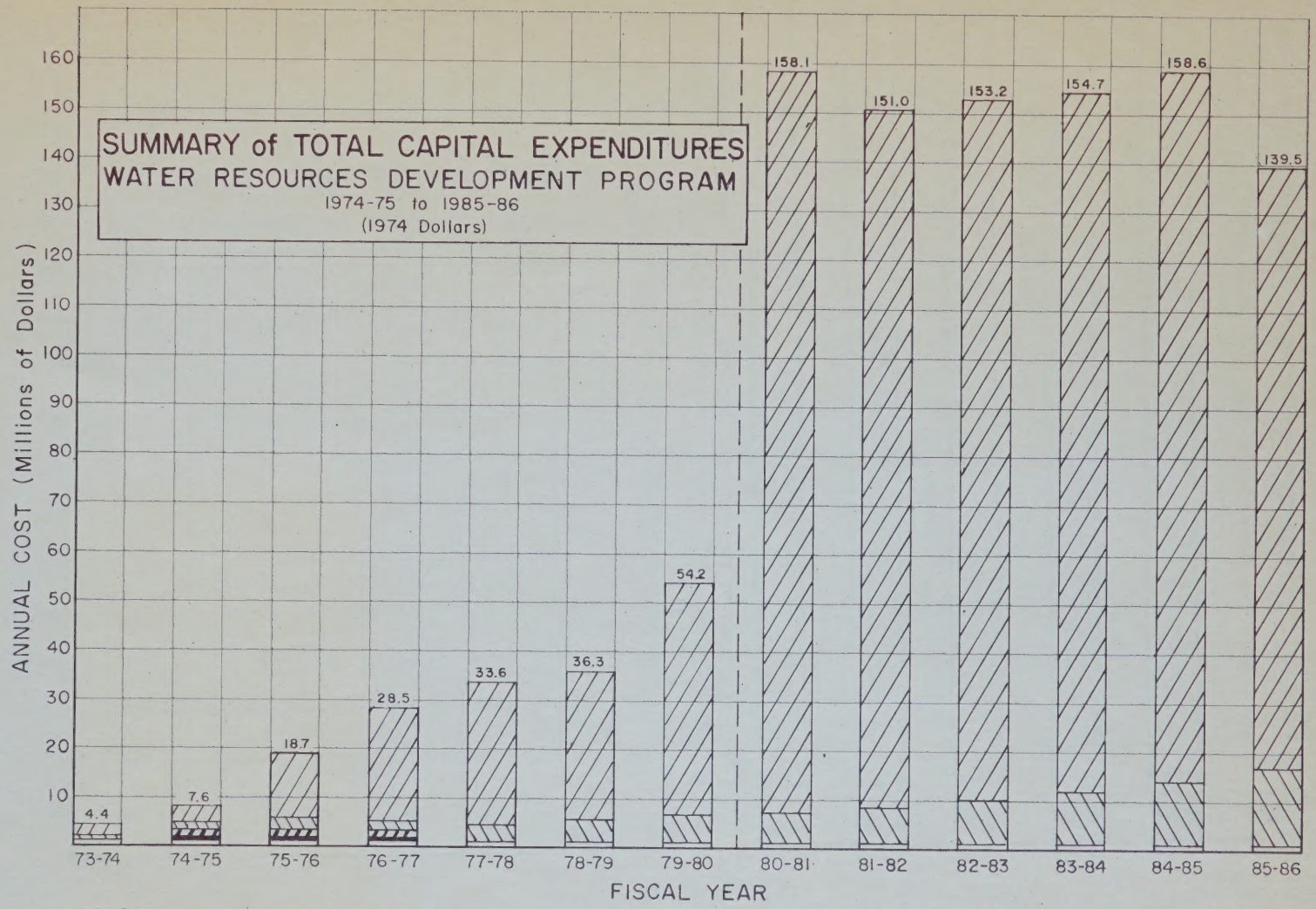
It should be emphasized that the levels of expenditure presented are on the basis of water resources development requirements which are identified at the present time. Recognition and identification of problems and demands is a continuous process, and therefore these levels of expenditure should not be regarded as conclusive.

The projected levels of expenditure are presented as the means to meet the objectives of the government's major policy decisions with respect to water resources development and management as outlined in Position Papers #5, #6 and part of #17.

Respectfully submitted,

E. E. Ballantyne

E.E. Ballantyne, D.V.M.
Deputy Minister



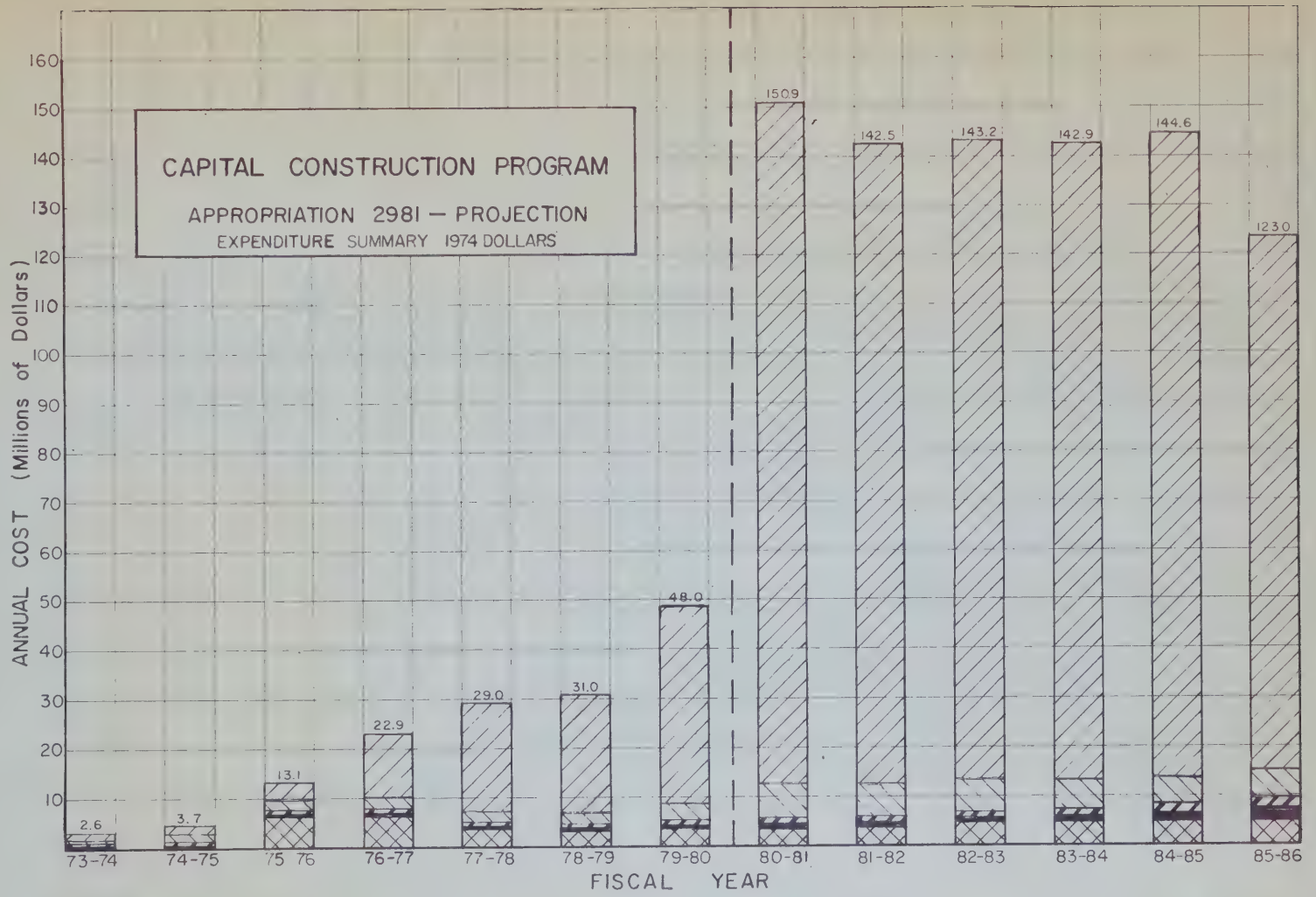
LEGEND

- P.E.P.
- APPROPRIATION 2983
- APPROPRIATION 2993
- APPROPRIATION 2995
- APPROPRIATION 2981

Alberta
ENVIRONMENT
ENGINEERING SUPPORT SERVICES
AUGUST, 1974

Reference to Table I Appendix "A"

FIGURE I



LEGEND

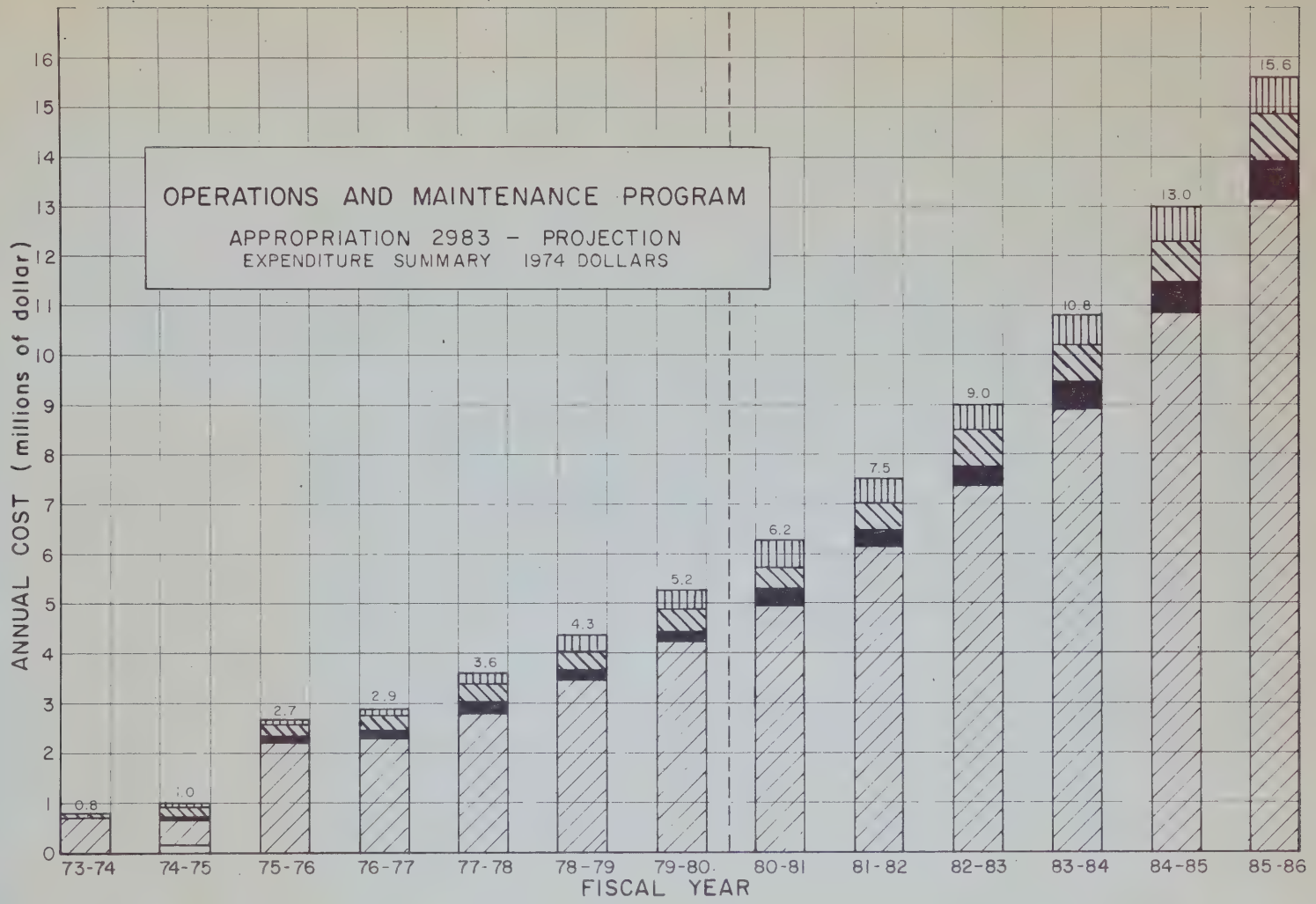
- River Basin Projects, Category I
- Lake Stabilization Projects, Category II
- Regional Projects, Category III
- Consulting Services, Category IV
- Municipal Water Supply (Secure Source), Category V

Alberta
ENVIRONMENT

ENGINEERING SUPPORT SERVICES
AUGUST 1974

Reference to Table 2 Appendix "A"

FIGURE 2



LEGEND

- Ice jams, stream flow maintenance, river training works – Section I
- General Operations and Maintenance – Section II
- Headworks Operation and Maintenance – Section III
- Headworks Rehabilitation – Section IV
- Flooding Rehabilitation V

Alberta
ENVIRONMENT

ENGINEERING SUPPORT SERVICES
AUGUST, 1974

Reference to Table 3 Appendix "A"

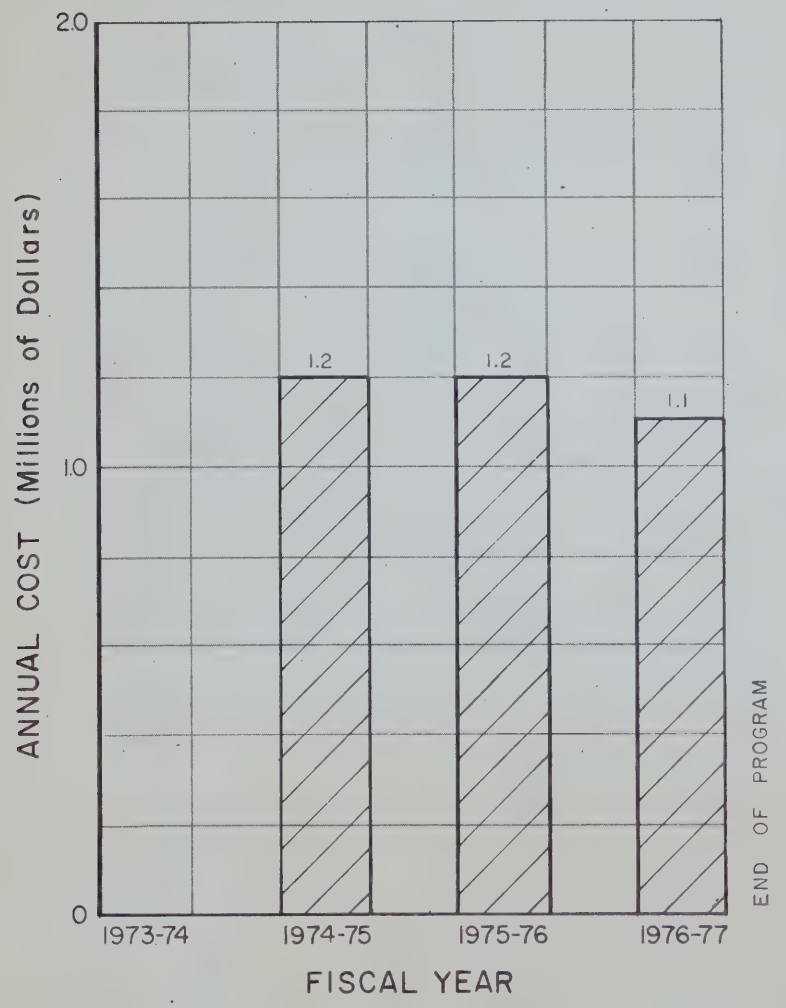
FIGURE 3

SECONDARY WORKS PROGRAM (Ends 1976-77)

PROJECTED EXPENDITURES

APPROPRIATION 2993 (1974 Dollars)

FUNDS TRANSFERRED UNDER FEDERAL-PROVINCIAL AGREEMENT (3.5 Million)



Alberta
ENVIRONMENT
ENGINEERING SUPPORT SERVICES
AUGUST, 1974

Reference to Table 4 Appendix "A"

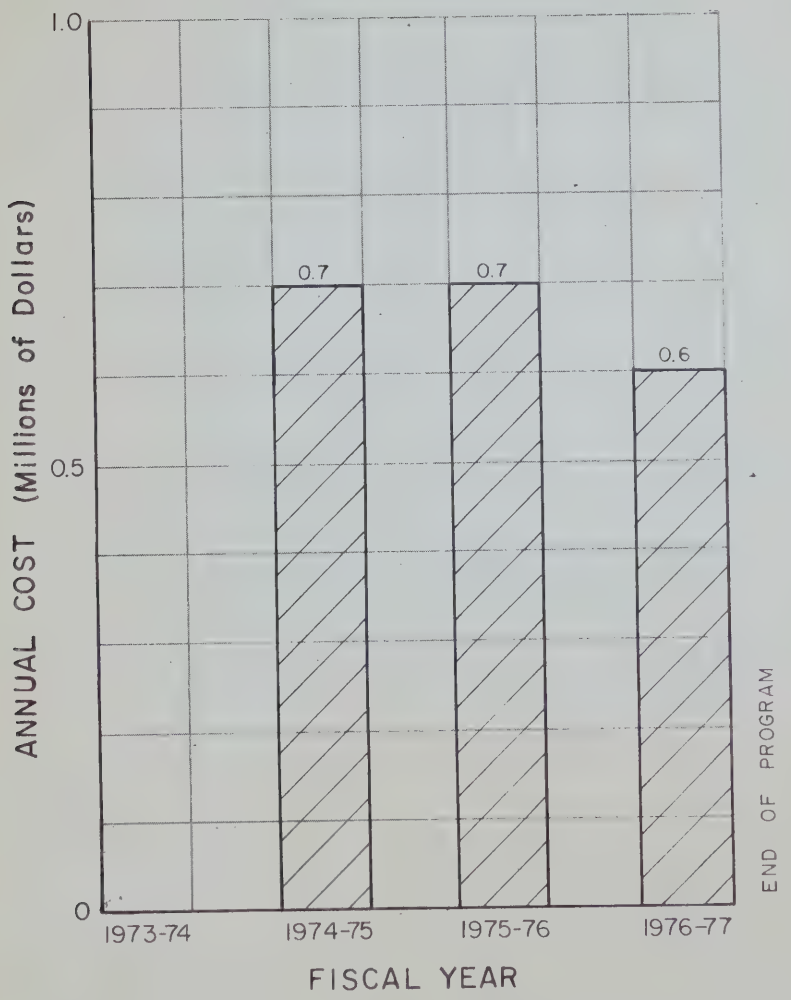
FIGURE 4

REHABILITATION OF C.-B.R. AND W.-S.M.R. HEADWORKS

PROJECTED EXPENDITURES

APPROPRIATION 2995 (1974 Dollars)

FUNDS TRANSFERRED UNDER FEDERAL-PROVINCIAL AGREEMENT (2.0 Million)



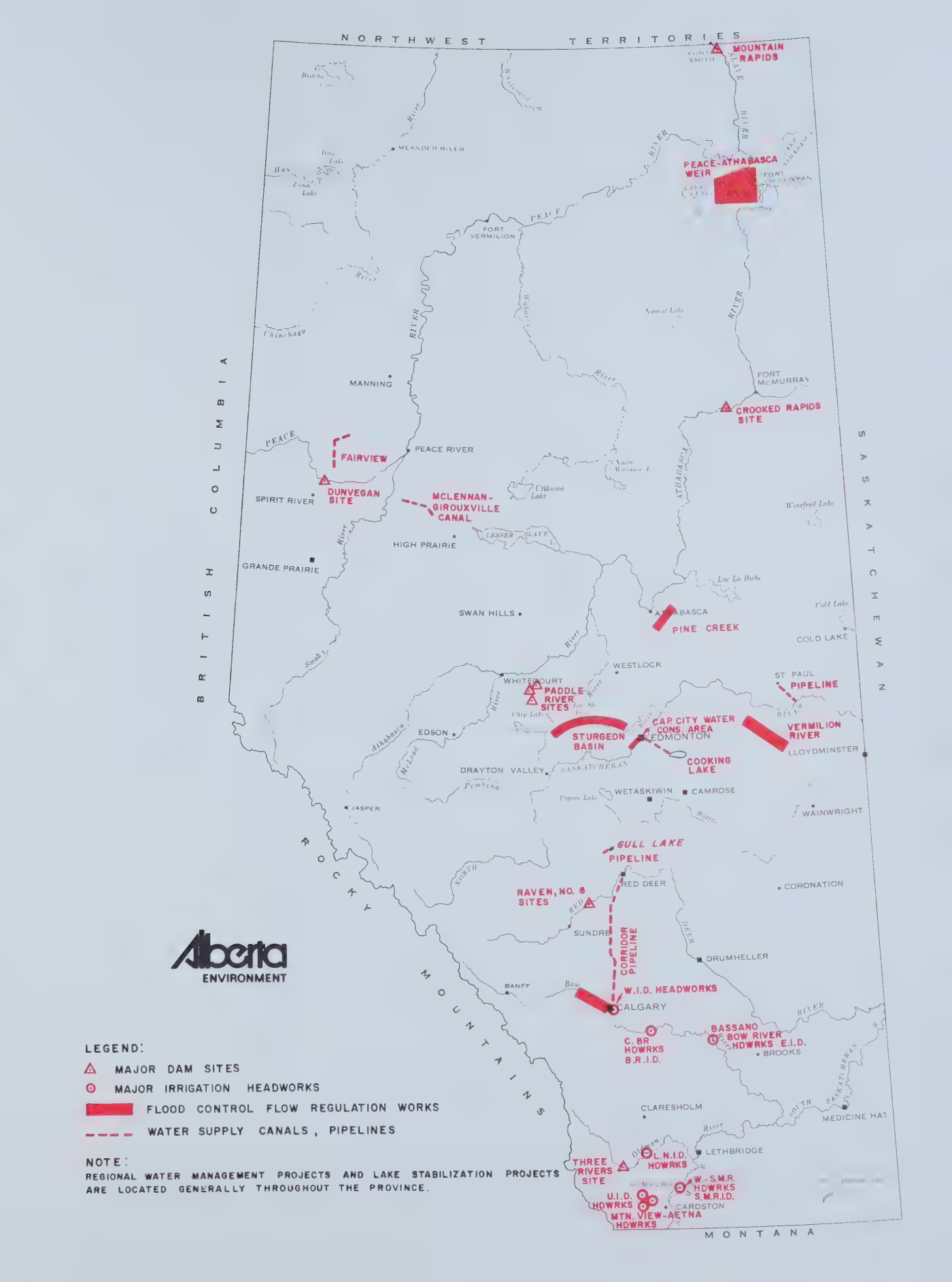
Alberta
ENVIRONMENT

ENGINEERING SUPPORT SERVICES

AUGUST, 1974

Reference to Table 5 Appendix "A"

FIGURE 5


NORTHWEST TERRITORIES
BRITISH COLUMBIA
SASKATCHEWAN
MONTANA
MOUNTAIN RAPIDS
PEACE-ATHABASCA WEIR
FORT VERMILION
MEANDER RIVER
MANNING
FORT McMURRAY
CROOKED RAPIDS SITE
FAIRVIEW
PEACE RIVER
DUNVEGAN SITE
SPIRIT RIVER
McLENNAN-GIROUXVILLE CANAL
HIGH PRAIRIE
GRANDE PRAIRIE
SWAN HILLS
ATHABASCA
PINE CREEK
COLD LAKE
WESTLOCK
WHITECOURT
PADDLE RIVER SITES
ST PAUL
PIPELINE
CAP CITY WATER CONS. AREA
EDMONTON
STURGEON BASIN
VERMILION RIVER
LLOYDMINSTER
EDSON
COOKING LAKE
DRAYTON VALLEY
WETASKIWIN
CAMROSE
WAINWRIGHT
JASPER
GULL LAKE PIPELINE
RED DEER
CORONATION
RAVEN, NO. 6 SITES
SUNDRE
CORRIDOR PIPELINE
DRUMHELLER
BANFF
W.I.D. HEADWORKS
CALGARY
C. BR HDWRKS B.R.I.D.
BASSANO BOW RIVER HDWRKS E.I.D.
BROOKS
CLARESHOLM
MEDICINE HAT
LETHBRIDGE
THREE RIVERS SITE
L.N.I.D. HDWRKS
W.-S.M.R. HDWRKS
S.M.R.I.D.
U.I.D. HDWRKS
CARDSTON
MTN. VIEW-AETNA HDWRKS
ROCKY MOUNTAINS
Alberta
ENVIRONMENT
LEGEND:
MAJOR DAM SITES
MAJOR IRRIGATION HEADWORKS
FLOOD CONTROL FLOW REGULATION WORKS
WATER SUPPLY CANALS, PIPELINES
NOTE:
REGIONAL WATER MANAGEMENT PROJECTS AND LAKE STABILIZATION PROJECTS ARE LOCATED GENERALLY THROUGHOUT THE PROVINCE.

DEPARTMENT OF THE ENVIRONMENT

ENVIRONMENTAL ENGINEERING SUPPORT SERVICES

WATER RESOURCES DEVELOPMENT PROGRAM

PROJECTED TOTAL CAPITAL EXPENDITURES

1974 Dollars (Millions)

TABLE 1

APPROPRIATION	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	TOTAL
2981	2.625	3.70	13.10	22.90	29.00	31.00	48.00	150.85	142.50	143.20	142.90	144.60	122.95	997.32
2983	.808	1.00	2.67	2.90	3.60	4.30	5.20	6.20	7.50	9.00	10.80	13.00	15.60	82.58
2993	-	1.20	1.20	1.10	-	-	-	-	-	-	-	-	-	3.50
2995	-	.70	.70	.60	-	-	-	-	-	-	-	-	-	2.00
P.E.P.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	13.00
TOTAL	4.433	7.60	18.67	28.50	33.60	36.30	54.20	158.05	151.00	153.20	154.70	158.60	139.50	1,098.35

See Figure 1

August 1974

DEPARTMENT OF THE ENVIRONMENT

ENVIRONMENTAL ENGINEERING SUPPORT SERVICES

WATER RESOURCES DEVELOPMENT PROGRAM

APPROPRIATION 2981 - PROJECTION (MILLIONS)

(1974 Dollars)

EXPENDITURE SUMMARY

TABLE 2

CATEGORY	NAME	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	TOTALS
I	River Basin Projects	1.454	1.50	3.50	12.80	21.70	21.00	39.90	138.85	130.50	130.00	130.50	131.00	108.05	873.75
II	Lake Stabilization	.373	1.284	1.50	1.90	2.50	3.00	3.30	6.60	6.00	6.50	5.00	5.50	6.00	49.46
III	Regional Projects	.362	.611	.70	.75	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	13.22
IV	Consulting Services	.436	.305	.40	.45	.50	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	12.49
V	Municipal WaterSupply (Secure Source)	-	-	7.00	7.00	3.50	2.50	3.00	3.30	3.60	4.0	4.40	4.80	5.3	48.40
	TOTAL	2.625	3.70	13.10	22.90	29.00	31.00	48.00	150.85	142.50	143.20	142.90	144.60	122.95	997.32

August 1974

See Figure 2

DEPARTMENT OF THE ENVIRONMENT

ENVIRONMENTAL ENGINEERING SUPPORT SERVICES

WATER RESOURCES DEVELOPMENT PROGRAM

APPROPRIATION 2981 - PROJECTION (MILLIONS)

(1974 Dollars)

EXPENDITURE BREAKDOWN (Table 2)

CATEGORY	NAME	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	PROJECT TOTALS
1	River Basin Projects														
	1. Paddle River	.35	.30	1.00	2.00	3.00	4.00	5.00	2.85	-	-	-	-	-	18.50
	2. Vermilion River	-	.25	.50	.50	1.00	.50	-	-	-	-	-	-	-	2.75
	3. Athabasca Dam (Crooked Rapids)	-	.10	-	-	5.00	5.00	8.00	50.00	50.00	50.00	50.00	50.00	32.00	300.10
	4. Red Deer River Dam	-	.20	-	4.55	5.00	5.00	5.00	6.00	-	-	-	-	-	25.75
	5. Peace River Dam (Dunvegan)	-	-	-	-	-	-	10.00	65.00	65.00	65.00	65.00	65.00	65.00	400.00
	6. Pine Creek	-	.10	.25	.25	.25	-	-	-	-	-	-	-	-	.85
	7. Sturgeon Basin Development	-	-	-	.50	.50	.50	.50	-	-	-	-	-	-	2.00
	8. Oldman River Dam	-	-	-	-	1.45	4.00	5.00	10.00	10.00	10.00	10.00	10.00	4.55	65.00
	9. Slave River (Mountain Rapids)	-	-	-	-	-	-	1.00	1.00	1.00	-	-	-	-	3.00
	10. Capital City Water Conser. Area	SPECIAL APPROPRIATION													
	11. Bow River - Calgary	.40	.25	.50	3.00	3.00	2.00	2.00	-	-	-	-	-	-	11.15
	12. Others	.704	.30	1.25	2.00	2.50	3.00	3.40	4.00	4.50	5.00	5.50	6.00	6.50	44.65
	SUB-TOTALS	1.454	1.50	3.50	12.80	21.70	24.00	39.90	138.85	130.50	130.00	130.50	131.00	108.05	873.75

CATEGORY	NAME	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	PROJECT TOTALS
II	Lake Stabilization Projects														
	1. Cooking Lake	-	-	-	1.00	1.00	1.00	-	3.00	2.00	2.00	-	-	-	10.00
	2. Peace-Athabasca Weir	-	.50	.25	-	-	-	-	-	-	-	-	-	-	.75
	3. Smoky Lake	-	.04	.05	-	-	-	-	-	-	-	-	-	-	.09
	4. Gull Lake	.01	.60	1.00	-	-	-	-	-	-	-	-	-	-	1.61
	5. Fawcett Lake	-	-	-	.10	.10	-	-	-	-	-	-	-	-	.20
	6. Burnstick Lake	-	-	.10	-	-	-	-	-	-	-	-	-	-	.10
	7. Stoney Lake	-	-	-	.10	-	-	-	-	-	-	-	-	-	.10
	8. Others	.363	.144	.10	.70	1.40	2.00	3.30	3.6	4.0	4.5	5.0	5.5	6.0	36.61
	SUB-TOTALS	.373	1.284	1.50	1.90	2.50	3.00	3.30	6.60	6.00	6.50	5.0	5.5	6.0	49.46
III	Regional Projects														
	1. Peace River, Edmonton, Red Deer, Calgary, Lethbridge Regions (Sub-Totals)	.362	.611	.70	.75	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	13.22
IV	Consulting Services (Sub-Totals)	.436	.305	.40	.45	.50	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	12.49

CATEGORY	NAME	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	TOTALS
V	Municipal Water Supply														
	1. McLennan-Girouxville Canal	-	-	.50	.50	-	-	-	-	-	-	-	-	-	1.00
	2. Lac St Cyr Pipeline (St. Paul)	-	-	1.50	.50	-	-	-	-	-	-	-	-	-	2.00
	3. Red Deer-Cal. Corridor Pipeline	-	-	4.25	4.25	1.5	-	-	-	-	-	-	-	-	10.00
	4. Fairview Water Supply	-	-	.25	.25	-	-	-	-	-	-	-	-	-	.50
	5. Carmangay Water Supply	-	-	.10	-	-	-	-	-	-	-	-	-	-	.10
	6. Cardston Water Supply	-	-	.15	.25	-	-	-	-	-	-	-	-	-	.40
	7. Hanna Water Supply (Fox Lake)	-	-	.25	-	-	-	-	-	-	-	-	-	-	.25
	8. Smoky Lake Water Supply	-	-	-	.25	-	-	-	-	-	-	-	-	-	.25
	9. Others	-	-	-	1.00	2.00	2.50	3.00	3.30	3.6	4.0	4.4	4.8	5.3	33.90
	SUB-TOTALS	-	-	7.00	7.00	3.50	2.50	3.00	3.30	3.6	4.0	4.4	4.8	5.3	48.40
	GRAND TOTAL	2.625	3.70	13.10	22.90	29.00	31.00	48.00	150.85	142.50	143.20	142.90	144.60	122.95	997.32

APPROPRIATION 2981

THE FOLLOWING LIST OF PROJECTS ARE EXAMPLES OF PROJECTS WHICH MAY BE IMPLEMENTED IN CATEGORY III REGIONAL WATER MANAGEMENT PROJECTS

CATEGORY III - REGIONAL WATER MANAGEMENT PROJECTS

A. Peace River Region

1. Kleskun Creek Drain
2. Berwyn Erosion Control
3. Ryan Creek Control
4. Village of Kinuso Flood Control
5. Northmark Flood Control
6. High Prairie Airport Drainage
7. Reber Flood Control
8. Town of Peace River Flood Protection (Dyking)
9. Hamlet of Enilda Flood Control
10. Burnt River Erosion Control
11. Clairmont and Ferguson Lakes Flood Control
12. North Hotchkiss Flood Control
13. New Town of Fox Creek Flood Control
14. Pats Creek Flood Control
15. Grimshaw Flood Control

B. Edmonton Region

1. Dapp Creek Flood Control
2. Town of Red Water Flood Control
3. Big Hay Lakes Drainage District - Rehabilitation
4. Ribstone Creek Flood Control
5. Holden Drainage District - Rehabilitation
6. Daysland Drainage District - Rehabilitation
7. Manawan Drainage District - Rehabilitation
8. Town of Viking Flood Control
9. Town of Drayton Valley Erosion Control
10. Deer Park Subdivision Flood Control
11. Edson River - River Training
12. Bashaw Recreation Dam
13. Beaver Creek Diversion
14. Namepi-Kennedy Flood Control
15. Sturgeon River Erosion Control

16. Alberta Beach Flood Control
17. Wavy Lake Flood Control
18. Hamlet of Buford
19. City of Wetaskiwin Flood Control

C. Red Deer Region

1. Waskasoo Creek Dam
2. Tindastoll Creek Erosion Control
3. Dickson Drainage District - Rehabilitation
4. Cygnet Lake Drainage District - Rehabilitation
5. Water Valley Park
6. Silver Creek Park
7. Parlby Creek - Spotted Lake Flood Control
8. Gap Lake Dam

D. Calgary Region

1. Bow River (Steirs Ranch) - River Training Works
2. Madden Flood Control
3. Springbank Creek Diversion
4. Town of Cochrane Flood Control
5. Wimborne Recreation Dam
6. Town of Black Diamond Flood Control
7. Drumheller (Twin Hills Flood Control)
8. Squaw Coulee (Mosquito Creek Project)
9. Keoma Flood Control
10. Irricana Recreation Dam
11. Rockyford Recreational Dam
12. Acme Recreational Dam
13. Bassano Flood Control
14. Consort Recreational Dam
15. Canmore West Flood Control

E. Lethbridge Region

1. Town of Claresholm Flood Control
2. 8 Mile Lake Flood Control
3. Reid Hill Erosion Control
4. Pine Coulee Flood Control
5. Lee Creek Erosion Control
6. Hartman Drain
7. Beaver Dam Lake
8. Tyrrell Lake Project
9. Wilson Drain
10. Town of Coleman Erosion Control
11. River Training Works on the Oldman, Belly & St. Mary River
12. Town of Taber Flood Control

DEPARTMENT OF THE ENVIRONMENT

ENVIRONMENTAL ENGINEERING SUPPORT SERVICES

WATER RESOURCES DEVELOPMENT PROGRAM

APPROPRIATION 2983 - PROJECTION (MILLIONS)

(1974 Dollars)

EXPENDITURE SUMMARY

TABLE 3

SECTION	NAME	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	TOTAL
I	Ice Jams, Stream Flow Maintenance and River Training Works	-	.10	.11	.17	.23	.29	.35	.42	.49	.56	.63	.70	.78	4.83
II	General Operation & Maintenance	.058	.20	.25	.30	.35	.40	.45	.51	.57	.64	.72	.81	.91	6.17
III	Headworks Operation & Maintenance	-	.05	.15	.17	.19	.21	.25	.30	.36	.44	.53	.63	.75	4.03
IV	Headworks Rehabilitation	.750	.50	2.16	2.26	2.83	3.40	4.15	4.97	6.08	7.36	8.92	10.86	13.16	67.40
V	Flooding Rehabilitation	-	.15	-	-	-	-	-	-	-	-	-	-	-	.15
	TOTAL	.808	1.00	2.67	2.90	3.60	4.30	5.20	6.20	7.50	9.00	10.80	13.00	15.60	82.58

See Figure 3

August 1974

DEPARTMENT OF THE ENVIRONMENT

ENVIRONMENTAL ENGINEERING SUPPORT SERVICES

WATER RESOURCES DEVELOPMENT PROGRAM

APPROPRIATION 2983 - PROJECTION (MILLIONS)

(1974 Dollars)

EXPENDITURE BREAKDOWN (TABLE 3)

SECTION	NAME	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	TOTALS
1	Ice Jams, Stream Flow Maintenance and River Works. (sub- totals)	-	.10	.11	.17	.23	.29	.35	.42	.49	.56	.63	.70	.78	4.83
11	General Operation & Maintenance (sub-totals)	.058	.20	.25	.30	.35	.40	.45	.51	.57	.64	.72	.81	.91	6.17
111	Headworks Operation & Maintenance (sub-totals)	-	.05	.15	.17	.19	.21	.25	.30	.36	.44	.53	..63	.75	4.03
1V	Headwork Rehabilitation	.750													
	(a) Belly-River-Cochran Lake (U.I.D.)														
	Materials testing-Design		.10												
	Canal & River Gate Structure			.60											
	Weir & Abutments				.80										
	(b) Oldman River (L.N.I.D.)														
	Weir & Flume Wooden Trestle		.30												

SECTION NAME	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	TOTAL
Weir & Canal			1.10											
Weir & Flume Envelope				.85										
Hollandale Spillway & Check				.10										
Canal - Flume River Piers					1.10									
Rocky Coulee Syphon					.70									
Complete Weir						.50								
Willow Creek Flume						.20								
Keenex Syphon						.20								
KyisKop Spillway						.03								
Monarch Branch Headgates						.02								
Monarch Branch Check						.03								
Bridges, Access Roads Main Canal							.80	.90	1.00	1.10	1.20	1.30	1.40	
(c) Belly River -Paine (Mtn.V. Aetna)														
4 chute structures		.10												
To be determined			.10	.10	.10	.10		.10	.20	.30	.40	.50	.60	
(d) Waterton - St. Mary (S.M.R.P.)					.20	.20	.40	.50	.60	.70	.80	.90	1.00	
(e) Carseland - Bow River (B.R.P.)					.20	.20	.40	.60	.80	1.10	1.20	1.50	2.00	
(f) Calgary - Bow River (W.I.D.)						.10								

SECTION	NAME	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	TOTALS
	(g) Bassano - Bow River (E.I.D.)														
	North Branch Headgates						.15								
	East Branch Headgates						.32								
	(h) Landscaping & Development			.30	.34	.40	.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	
	(i) Others			.06	.07	.13	.85	1.55	1.37	1.48	1.66	2.32	3.16	4.15	
	Sub - totals	.75	.50	2.16	2.26	2.83	3.40	4.15	4.97	6.08	7.36	8.92	10.86	13.16	67.40
V	Flooding Rehabilitation (sub-totals)		.15	-	-	-	-	-	-	-	-	-		-	.15
	TOTAL	.808	1.00	2.67	2.90	3.60	4.30	5.20	6.20	7.50	9.00	10.80	13.00	15.60	82.58

DEPARTMENT OF THE ENVIRONMENT

ENVIRONMENTAL ENGINEERING SUPPORT SERVICES

SECONDARY WORKS PROGRAM - PROJECTED EXPENDITURES (MILLIONS)

PROGRAM ENDS 1976-77

FEDERAL - PROVINCIAL IRRIGATION AGREEMENT

DISPOSITION OF FUNDS

TABLE 4

	1974-75	1975-76	1976-77
SECONDARY WORKS	1.20	1.20	1.10

See Figure 4

August 1974

DEPARTMENT OF THE ENVIRONMENT

ENVIRONMENTAL ENGINEERING SUPPORT SERVICES

REHABILITATION OF B.R.P. & S.M.R.P. HEADWORKS - PROJECTED EXPENDITURE

APPROPRIATION 2995 (1974 Dollars)

FUNDS TRANSFERRED UNDER FEDERAL - PROVINCIAL AGREEMENT (2.0 Million)

TABLE 5

	1974-75	1975-76	1976-77
Rehabilitation B.R.P. & S.M.R.P. Headworks	.70	.70	.60

See Figure 5

August 1974